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New strategy of upgrading slum areas in developing countries using vernacular trends to achieve a sustainable housing development

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Abstract:

Vernacular architecture is surely a contradiction in terms. The vernacular is the unconscious work of craftsmen based on knowledge accumulated over generations – the very opposite of architecture, which involves a premeditated design process with a conscious appeal to the intellect. Yet, the term is convenient shorthand to describe an approach that adopts the spirit of the vernacular; if not its actual forms it is not intended to indicate a new style.

In fact, many of the architects featured here reject the concept of style. Instead, describe their intention to reflect by analogous inspiration the characteristics of local buildings, their scale in particular, whether they have chosen to concentrate on the use of materials, the landscape, the local culture or even no more than the idea of continuity with the past.

According to what is seen nowadays in Egypt from increasing in the random self-built areas (slums areas), which is one of the main issues facing the development in developing countries, studies are trying to find out a way to help instead of depending on our governments all the time.

And this paper will try to investigate the minimum parameters that are required to create vernacular urban spaces through proposing a new strategy for the slums upgrading projects by finding the similarities between vernacular urbanism and slums. By this way we could help the governments (especially in the third world countries) to find out a way to solve their housing problems through the rapid increase in population growth, without facing the troubles of the informal areas and slums phenomena and to achieve sustainable housing development depending on the concept of ‘self-built’ environments.

Keywords

Vernacular architecture, slums upgrading, sustainable development, housing problem, third world countries.

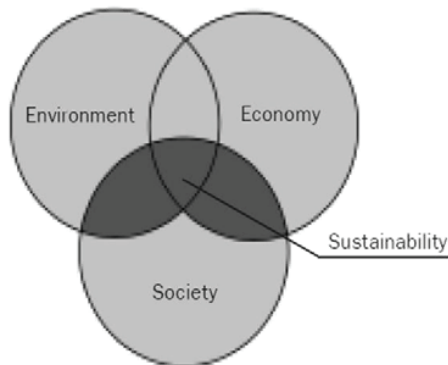
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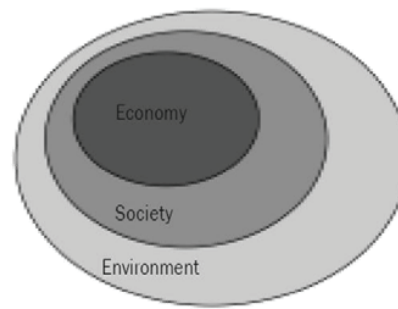
1. SUSTAINABLE ARCHITECTURE:

Buildings and the built environment play a major role in the human impact on the natural environment and on the quality of life. Architecture is normally built and meant to stay in a useful order for at least several decades or even hundreds of years. Its performance, whether negative or positive, will cause an impact on the environment throughout its life span. Moreover, according to Brian Edwards, architecture is responsible for about half of total global resource consumption due to the use of materials, energy, water, and the loss of fertile farmland which is replaced by buildings.

Since architecture and environment have a close relationship in terms of cause and effect, better building and a more sustainable architecture will be one of the solutions toward sustainability.¹



(Figure 1) Weak sustainable development



(Figure 2) Strong sustainable development

Source: Hengrasmee, S., “The Study of Sustainable Architectural Design in Thailand”, Faculty of Architecture and Planning, Thammasat University, Journal of Architectural/Planning Research and Studies Volume 5. Issue1. , 2007.

2. SELF-BUILT ARCHITECTURE:

2.1 Vernacular approach

Oliver offers the following simple definition of vernacular architecture²:

“The architecture of the people and by the people”

In vernacular architecture it is equally reasonable for people in daily connection with nature to seek its conquest through processes that smooth the rough and brighten the dull, altering the natural into artificial. Local materials are their resources, their technologies are powered by their own muscles, but their aim is to create emblems of cultural presence. If vernacular technologies involve local materials and touch of the hand, their contrast is with industrial systems of production. Where, vernacular technology depends on their direct connections.³



(Figure 3) Rapoport's idea about assessing vernacular architecture

¹ Hengrasmee, S., “The Study of Sustainable Architectural Design in Thailand”, Faculty of Architecture and Planning, Thammasat -University, Journal of Architectural/Planning Research and Studies Volume 5. Issue 1, 2007.

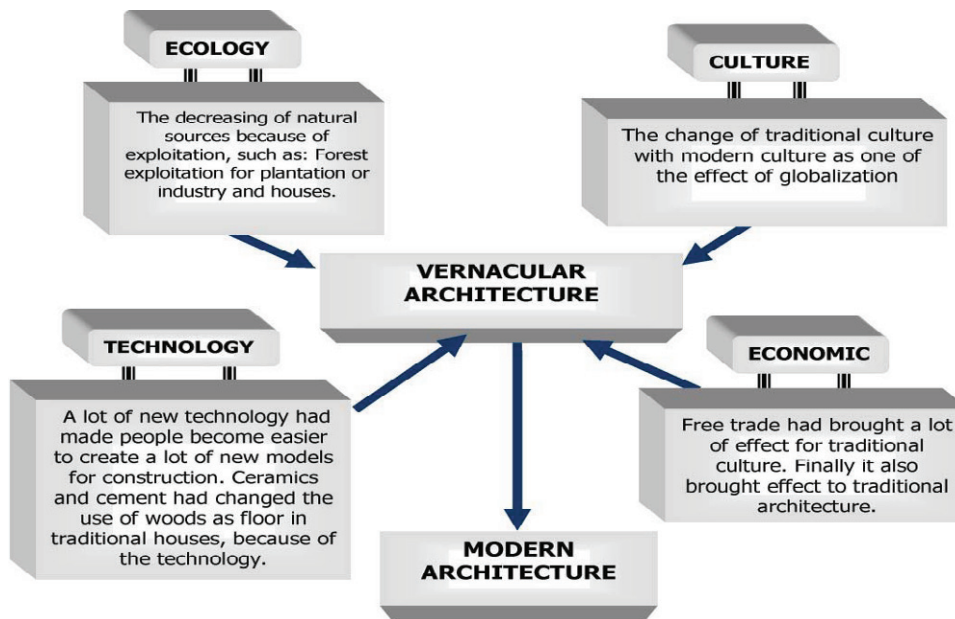
² Oliver, P., “Build to meet needs: Cultural issue in vernacular architecture”, Architectural press, 2006

³ Glassie, H., “Vernacular architecture”, Indian university press, 1999. P.31

Source: Islam, A.K., “patterns and changes of vernacular architecture in Bangladesh: An application of Amos Rapoport’s theory of defining vernacular design”, The Royal Institutes of Technology, Stockholm, Sweden, JAN., 2003.

So, we find out that the principles of sustainable are on the same direction of that of the vernacular as; (the relation between the built environment and the surrounding nature).

The change of ecology, mixing culture, technology and economic development has changed the vernacular architecture. The effects are related to each other, the ecology is affected by the technology then the technology is affected by the condition of economic. Economic also brought effect to the culture and so on. The architectonic concepts have been pronouncedly affected by multifarious cultural influences brought along by several invaders, colonizers, missionaries, merchants and traders. Traditionally, the most significant foreign architectural influences have affected the building styles and techniques.¹



(Figure 4) How does ecology, culture, technology and economic change vernacular architecture

Source: Husna, A., “Healthy building for the earth Vernacular Architecture as Sustainable Term of Housing; Case study in Indonesia”, Institute of technology-Surabaya, Indonesia, 2009.

Where appearances are misleading, failing to portray ecological degradation or ecological health, public opinion may be ill-informed, with consequences for environmental policy. If we do not recognize this difference, we have problems with the appearance of ecological systems. Three influential problems are²:

- 1) The problem of the false identity of ecological systems,
- 2) The problem of design and planning as deceit about ecological systems
- 3) The problem of invisible ecological systems. These problems for environmental policy may be resolved in part if urban planners and policy-makers use socially-recognized signs to display human intentions for ecological systems.

¹ Husna, A., “Healthy building for the earth Vernacular Architecture as Sustainable Term of Housing; Case study in Indonesia”, Institute of technology-Surabaya, Indonesia, 2009.

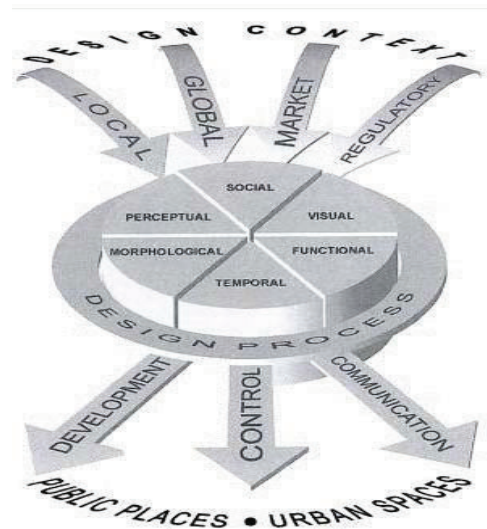
² Nassauer, J.I., “The appearance of ecological system as a matter of policy”, Journal: Landscape ecology, Springer Netherlands, 8 NOV., 2004.

2.2 Informal approach – Slums:

Slums usually do not have basic physical infrastructures networks such as potable water, wastewater, solid waste system, electricity, roads and emergency access, lack of basic community's services such as, educational, health and social facilities, Social segregation between slums and better-off neighborhoods increase the tensions in the poorer areas, and Unplanned developments of settlements increase the complication in the provision of services¹.

2.3 Urban approach:

Urban space should have certain qualities if it is to be responsive to human feelings and sensibilities. Historical spaces were the result of intuition, traditional rules of thumb, social conditions, and the limitations of available materials. They were probably neither the result of conscious thought, nor the application of a set of rules².



(Figure 5) Effect of design context on spaces

Source: Carmona, M., Heath, T., and Steve Tiesdell, "Public places, Urban spaces: The dimensions of urban design", Architectural press, 2003

There are a set of broad "contexts" local, global, market and regulatory that constrain and inform all areas of urban design actions. Although these contexts change over time at any particular moment they are relatively fixed and typically outside the scope of the urban design practitioner's influence. Hence, in relation to individual urban design projects and interventions they have to be accepted as givens.³

3. Factors affecting the urban context of self-built environments:

Factors affecting the urban form of self-built environments have been investigated by several theorists who grouped them according to different categories such as; (Lawrence, Studer, Paul Oliver, Lozano, and Rapoport).

These factors are: (Location, Topography, Climate, Land sub-division, Economical factor, Socio-cultural factor, Building materials/ methods).

¹ Tag-Eldeen, Z.E., "Participatory Urban Upgrading: The Case of Ezbet Bekhit Cairo, Egypt", Royal Institute of Technology, Stockholm, 2003.

² Salingaros, N.A., "Urban space and its informal field", Journal of urban design, Vol.4, 1999.

³ Carmona, M., Heath, T., and Steve Tiesdell, "Public places, Urban spaces: The dimensions of urban design". Architectural press, 2003.P.36

3.1 Physical elements of self-built environments:

Factors affecting the urban form of self-built environments have several physical variables, that affected directly by the factors of self-built environments are¹;

Open Space	Road Hierarchy	Settlement Pattern	Town
Cramming	Districts	Building Lines	Density
Layout	Street Pattern	Block Size	Edge
Incremental Design	Nodes	Space Network	Street
Width	Block Shape	Unity	Massing
Materials	Color	Focal Points	Form
Landmarks	Rhythm	Roofscape	Skyline
Texture	Openings	Elevation Width	Enclosure
Variety	Gateway	Human Scale	

3.2 The Minimum elements which required creating vernacular urban spaces through the slums upgrading:

Some main elements are taken into a study to investigate the minimum parameters that are required to create vernacular urban spaces through the slums upgrading projects by finding the similarities between vernacular urbanism and slums. And this was done through making questionnaire to find out about common urban elements (Similar, Partial similar, Different) and also the ability of adaptation of these elements (Easy, Moderate, Difficult), taking the case study of Manshiet Nasser (Slums area), Dakhleh Oasis (Vernacular area) and using pictures for these elements as an analytical study between both self-built environments.

And as a conclusion it was find out that some elements are difficult to be adapted (see figure 6), while they have the priority of adaptation (e.g. space networks, town cramming and density, and street width)².

4. New strategy of upgrading slum areas in developing countries using vernacular trends - Three phases:

According to this questionnaire survey these elements were put-in into categories according to their priority of upgrading -what ever they are difficult or easy to be adopted- (see figure 7). And these priorities were classified into 3 phases which represent the “New strategy of upgrading slum areas in developing countries using vernacular trends”, these phases are:

4.1 FIRST PHASE- Planning Adjustment; although this phase contains difficult physical elements, but it is a primary stage for upgrading any required area.

- | | | |
|------------------------------|-------------------------|------------------------------|
| a. Layout and building lines | b. Space networks | c. Town cramming and density |
| d. Street width | e. Form of urban tissue | f. Road hierarchy |

4.2 SECOND PHASE - Facades Adjustment; this stage will help in improving the visual image as a whole, through changing in the building's facades.

- | | | |
|---------------|-------------------------|--------------------|
| a. Openings | b. Materials and colors | c. Elevation width |
| d. Block size | e. Texture | |

¹ Ibrahim, H., “An analytical comparative approach to the relationship between spontaneous and vernacular settlements”, Faculty of engineering, Cairo university, Giza, Egypt, SEP., 2000.

² Shawket, I., “New strategy of upgrading slums areas using vernacular trends; comparative study of: Dakhleh Oasis and Manshiet Nasser”, Cairo university, 2011.

4.3 THIRD PHASE - Urban Image Adjustment; when upgrading using a successful landmark, respecting edges of the surrounding environment, and using roofs according to the activities required, there should be a unique image for each individual area.

a. Landmarks/ key buildings

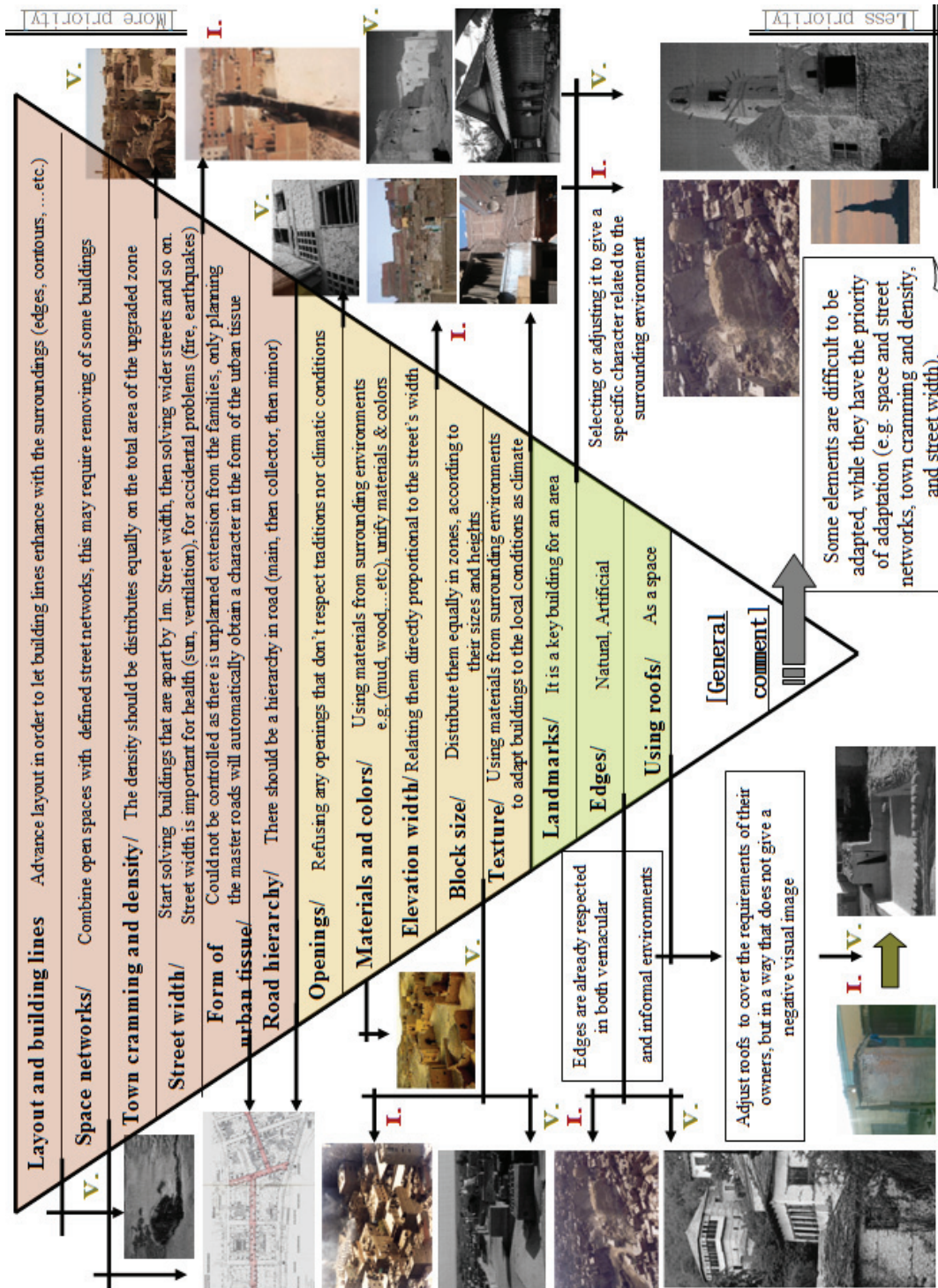
b. Edges

c. Using roofs

Vernacular and Informal architectural environments	Similar	Partial similar	Different	Ability of adaptation			General comment
				easy	moderate	difficult	
Layout and building lines		●			●		Its change is a direct result of adapting other physical elements
Space and street networks			●		●		A totally different element, but it could partially changes
Town cramming		●				●	Both environments have the problem of population, and solving this problem is very difficult
Street width			●			●	Its difficulty comes from the requirement of removing buildings in order to adapt street widths
Form of urban tissue			●			●	There should be a character for each area, reflected in the form of its urban tissue
Road hierarchy		●		●			Almost it exists in informal spaces, but with very narrow streets
Openings			●	●			To change it, a way of thinking of this category of informal inhabitant should be changed
Materials and colors			●	●			Easy to change if the owners of the units help on this step
Elevation width			●			●	It requires removing and rebuilding of some units, which will be difficult
Block size		●		●			Are almost the same in both environments, as the social problems are the same in the same society
Texture			●		●		Texture is a special element, which we could hardly put under a general rule, as each country has its own
Landmarks	●			●			Directly produced in each area, by their inhabitants
Edges	●			●			Informal respect edges, as they have no money to adapt them to their needs
Using roofs			●	●			Figuring out the activities which roofs are used for, will help in achieving the required visual image

(Figure 6) Matrix shows the overall priorities of physical elements, and their ability of adaptation

Source: Indjy M., Shawket, 2011



(Figure 7) Three phases of upgrading slum areas in developing countries using vernacular trends

Source: Indjy M., Shawket, 2011.

5. CONCLUSIONS:

Through this study we find that we can adapt some urban elements in the Informal environment areas to transform them into Vernacular environment using a “New strategy of upgrading slum areas in developing countries using Vernacular trends” in three phases which are Planning Adjustment then Facades Adjustment and finally Urban Image Adjustment.



By this way we could help the governments (especially in the third world countries) to find out a way to solve their housing problems through the rapid increase in population growth, without facing the troubles of the informal areas and slums phenomena and to achieve sustainable housing development depending on the concept of ‘self-built’ environments.

Where the simple elegance of things which are designed to do their job functionally and effectively and which communicate visually, the way they work or the message they are intended to convey. So there should be a way to translate their need (= **function**) in a proper way (= **beauty**) through their hands (= **financial**) to create the required products in a proper way with adaptation of main physical elements affecting the visual status of the product.

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